COUNTY OF SAN DIEGO • DEPARTMENT OF PLANNING AND LAND USE
BUILDING DIVISION

SINGLE STORY CLAY SOIL FOUNDATION DESIGN*

A. MAJOR PROBLEMS COMMON TO CLAY SOILS

1. Clay soils shrink when allowed to lose their moisture, thereby causing withdrawal of support and allowing a concrete slab or foundation to move downward.

2. Clay soils expand when allowed to gain moisture. Soil expansion causes an upward pressure upon and an upward movement of a concrete slab or foundation.

3. Clay soils may be non-uniformly subjected to moisture changes that will cause soil shrinkage in some areas and soil expansion in others, resulting in withdrawal of support along some portions of the concrete slab or foundation, combined with an upward thrust on other portions of the slab or foundation, causing tilting or cracking of the concrete slab or foundation or complete structural failure with attendant cracking and other structural damage to the structure resting upon the concrete slab or foundation.

4. Capillary action in clay soil allows moisture to move through the soil. The upward migration through the soil to the under side of the concrete slab or foundation can cause a decrease in the bearing capacity of the soil.

5. Capillary action can result in moisture migration to the under side of the concrete slab. Moisture movement through the slab can result in damage to tiles, carpeting, or other materials installed on the upper side of the concrete slab.

B. AUTHORIZATION FOR USE OF CLAY SOIL FOUNDATION DESIGN

1. The design shown is authorized to be used for single-story structures at locations where moderately expansive soil conditions exist. Use of the design may be denied by the Building Official when site conditions indicate that use of the design may not be adequate to safeguard against structural damage.

2. The design may not supercede any foundation design prepared by a California Registered Civil Engineer for this site.

3. This design is not applicable to all sites. In instances where an unusual soil problem exists, the applicant will be required to retain a California Registered Civil Engineer in the private sector and have that engineer make recommendations, for our review, designed to resolve the problem that exists at the site.

C. RAISED WOOD FLOOR AND GRADE BEAM SPECIFIC FOUNDATION DESIGN REQUIREMENTS

1. Thoroughly Wet Soil
   Wetting places the clay soil in an expanded condition so as to preclude future expansion of the soil.

2. Footings to be 24" Deep
   Place footings at a depth where major changes in the moisture content of the soil will not occur as seasonal and ground surface water conditions vary.

3. Continuous Reinforcing Steel
   Continuous bars provide a beam action for the concrete footings to allow those footings to bridge across the underlaying clay soils that may not have uniform bearing ability or may not be subjected to uniform changes in moisture.

4. Girder sizes and post spacing depend upon the design of the building. All sizes must comply with the current U.B.C.

5. All footings must be constructed with a continuous concrete pour.

6. Drainage must be directed away from all footings.

Continued on page 2

** APPLICATION*

This plan may be used in lieu of a specifically engineered plan provided all of the details shown are built within their respective limits. No departure beyond these criteria will be allowed unless verified by a plan prepared by a civil engineer licensed in California. Use of this plan is limited to the unincorporated area of the County of San Diego.

DPLU#065 (10/98)

5201 RUFFIN ROAD, SUITE B, SAN DIEGO, CA 92123-1666 ● (619) 565-5920
200 EAST MAIN ST.- SIXTH FLOOR, EL CAJON, CA 92020-3912 ● (619) 441-4030
338 VIA VERA CRUZ - SUITE 201, SAN MARCOS, CA 92069-2620 ● (760) 471-0730

7. In order to prevent deep seated slope failure, the maximum slope of the building site must be limited to ten percent (10%).

8. Finished Grade to Slope Away from Structure
   A one percent (1%) minimum grade for at least a distance of 5' makes provision for water to travel away from the structure so as to preclude surface water wetting the clay soil immediately adjacent to the exterior footings that would cause loss of soil bearing value and changes in soil volume.

9. Masonry or concrete fireplaces may be used subject to the following criteria:

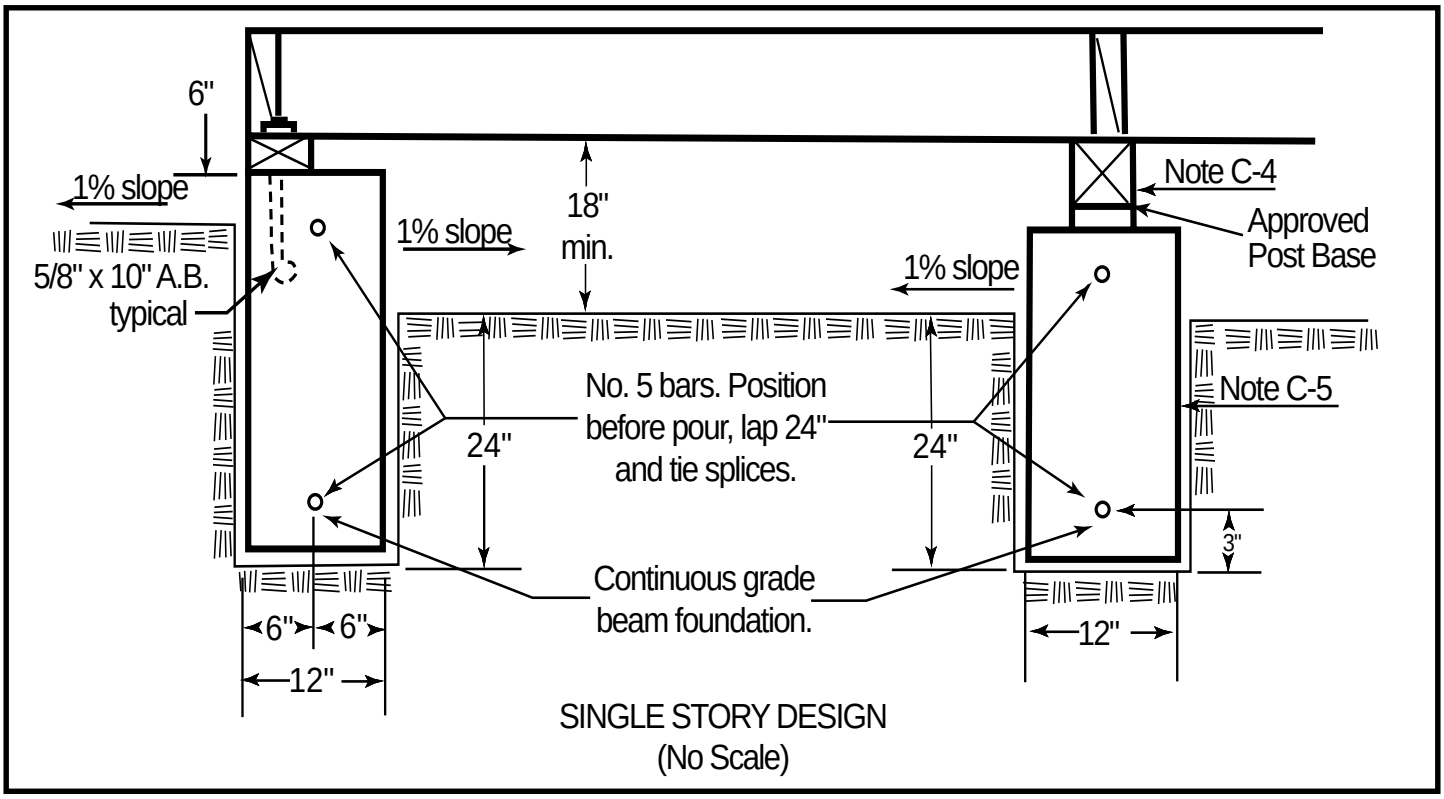
   a. Footings must be 15" thick and extend 24" below the adjacent grade.

   b. The overall fireplace height is limited to 17."

   c. Reinforce the footing with #4 horizontal bars at 6" O/C each direction and extending 6" into the foundation stem wall.

D. COMPLIANCE WITH DESIGN REQUIREMENTS PRIOR TO PLACING CONCRETE

No concrete shall be placed in the footing or slab areas until authorized by the Building Inspector.



SINGLE STORY DESIGN
(No Scale)

E. SLAB ON GRADE - SPECIFIC FOUNDATION DESIGN REQUIREMENTS

1. Thoroughly Wet Soil
   Wetting places the clay soil in an expanded condition soas to preclude future expansion of the soil.

2. Footings to be 24" Deep
   Place footings at a depth where major changes in the moisture content of the soil will not occur as seasonal and ground surface water conditions vary.

3. Continuous Reinforcing Steel
   Continuous bars provide a beam action for the concrete footings to allow those footings to bridge across the underlaying clay soils that may not have uniform bearing ability or may not be subjected to uniform changes in moisture.

4. Slab to be 4" Thick (Nominal)
   A 4" thick slab (nominal) provides what is deemed to be a minimum thickness to effectively serve as a reinforced concrete slab.

5. Slab reinforcement: #3 bars @ 18" o.c. each way
   Reinforcement in mid-slab prevents the slab from showing distress in the event non-uniform soil support or non-uniform soil expansive pressures develop.

6. Layer of 1/4" Min. Rock or Gravel (4" deep)
   Provides a capillarity breaker type of material. Moisture will not rise through the material as it would in the original clay or in a less coarse material, such as fine sand or fine granite.

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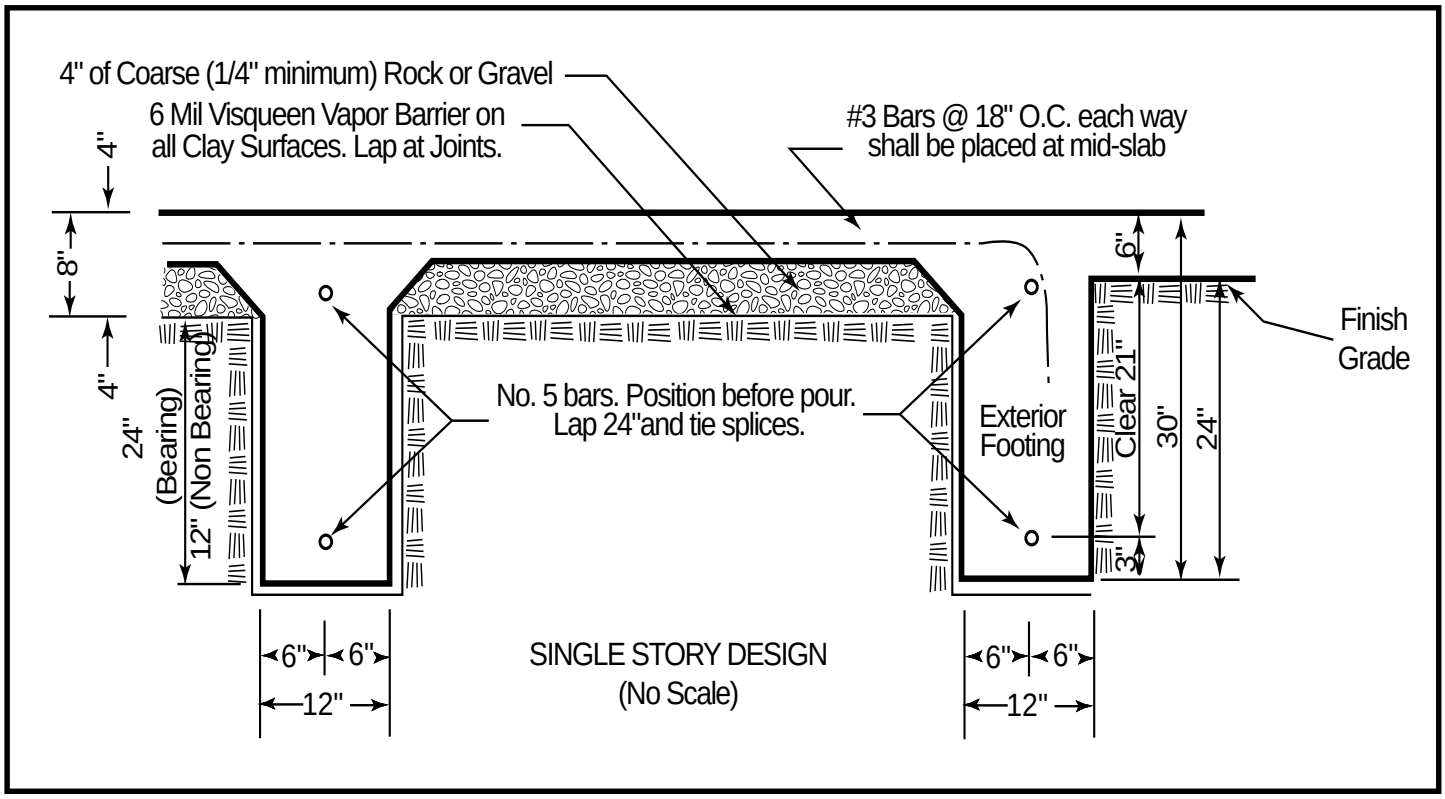
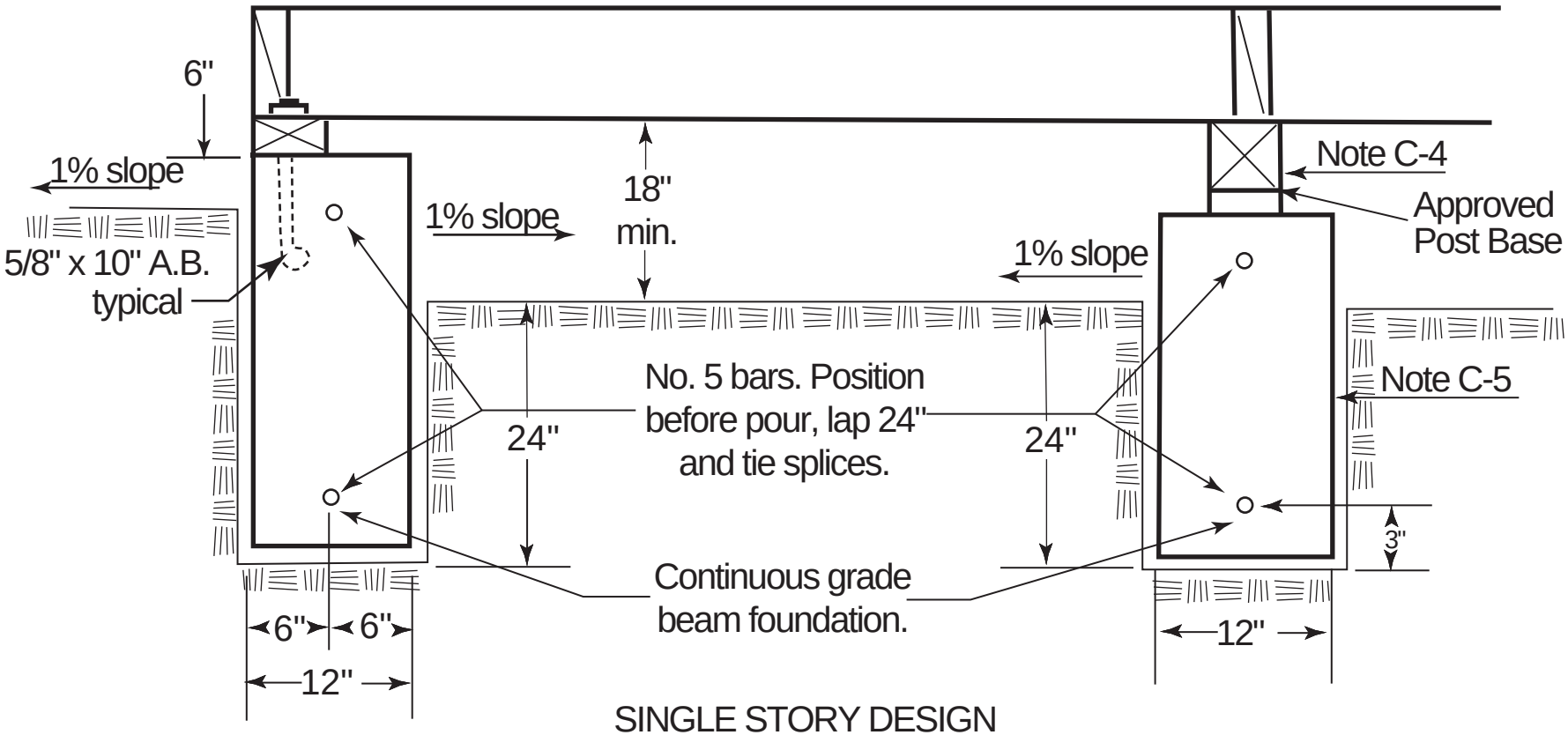
7. Visqueen Moisture Barrier (6 mil)
   Properly lapped, it provides a vapor seal atop and along the vertical sides of any exposed clay soil to seal off the moisture within the soil so as to reduce variations in the volume of the soil due to changes in moisture and to also reduce the risk of moisture migrating into the area between the under side of the slab and the top of the clay soil.

8. Refer to Items C5, 6, 7, 8 and 9 on Page 2.





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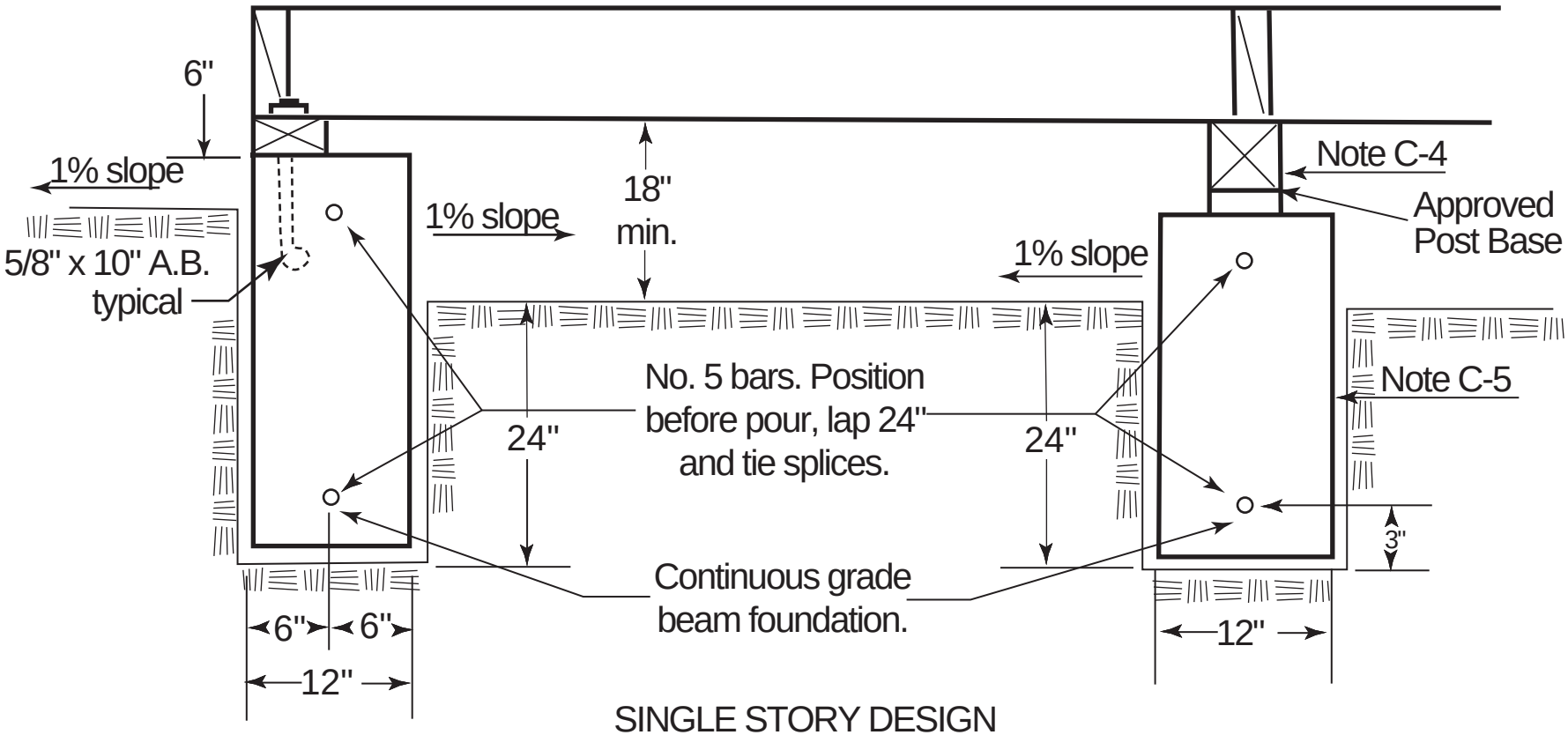

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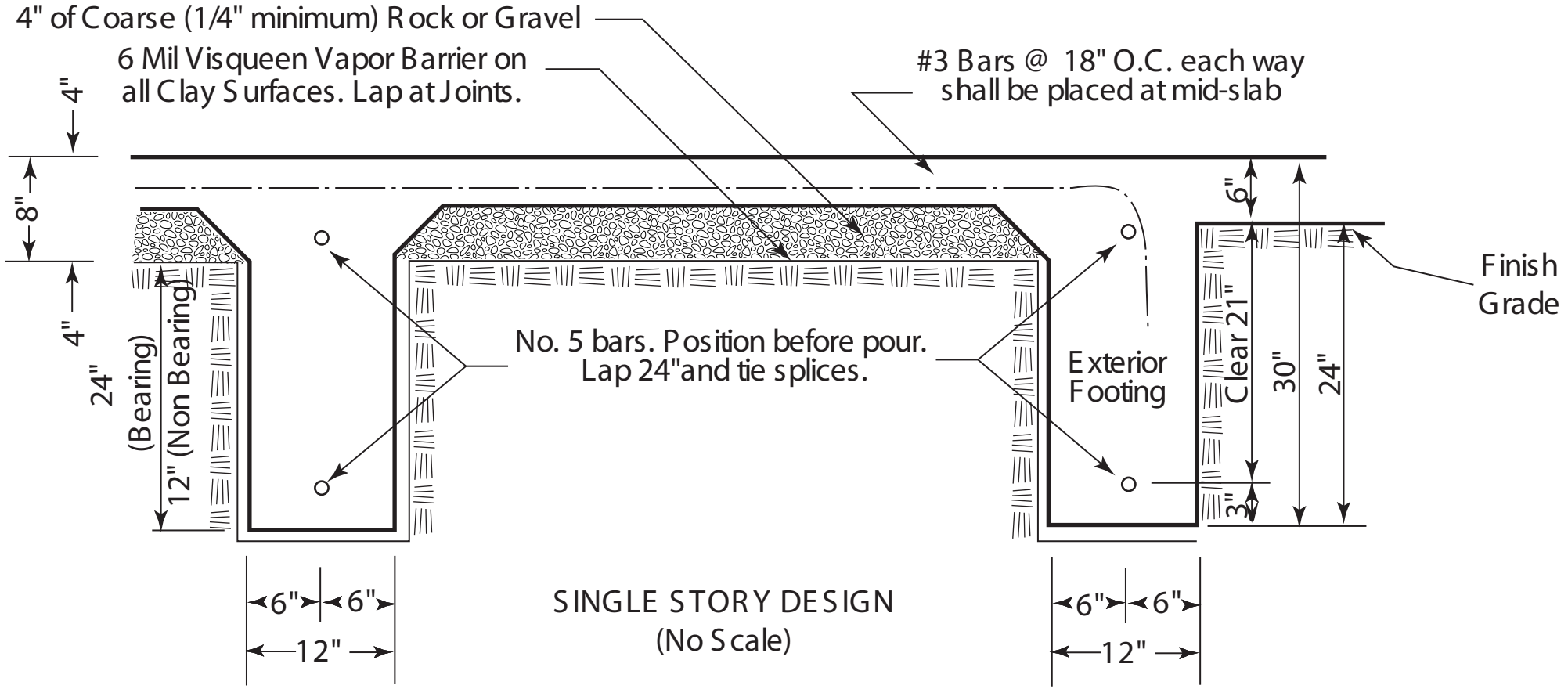

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